

May 11, 1993

22947 02

Mr. Wayne Grotheer Van Waters & Rogers Inc. 6100 Carillon Point Kirkland, Washington 98033

Pilot Boring Program Summary Boise Towne Square Mall Boise, Idaho

Dear Wayne:

Dubo Info

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MAY 1 3 1993

DIVISION OF ENVIRONMENTAL QUALITY SWIRO

Harding Lawson Associates (HLA) has prepared this letter for Van Waters & Rogers Inc. (VW&R) to summarize the pilot boring activities that were recently completed at the Boise Towne Square Mall, Boise, Idaho. The scope of work for the pilot boring program was originally presented in the Supplemental Pilot Boring Sampling and Analysis Plan, Boise Towne Square Mall, Boise, Idaho dated February 9, 1993 (Pilot Boring SAP). The scope consisted of drilling two pilot borings, collecting groundwater samples in the borings for vertical profiling, completing the borings as groundwater monitoring wells, collecting and analyzing groundwater samples from the wells, and conducting a geophysical pilot study. A more detailed description of the pilot boring program will be provided in the upcoming Boise Towne Square Mall Monitoring Well Sampling and Analysis Plan.

The field work was conducted between March 26 and April 23, 1993. Drilling, sample collection, equipment decontamination, and other field activities were conducted in accordance with the Pilot Boring SAP and the Quality Assurance Project Plan dated November 2, 1992. Two borings were drilled; MW-1 is located in the parking lot north of the Olive Garden restaurant and MW-2 is in the parking lot approximately 150 feet northeast of the State Well MW-1, north of the Pier 1 Import store. The borings were drilled under the supervision of HLA and VW&R representatives by Hiddleston Drilling and Pump, Mountain Home, Idaho, using air casing hammer techniques to maximum depths of 158 feet. The borings were logged by an HLA geologist using soil cutting samples collected at five-foot intervals. Copies of the boring logs are attached. The lithologic logs show, in general, extensive sand and gravel in the upper 150 feet.

Chemical profiling was performed in the borings when possible. As the borings were advanced, groundwater samples (grab groundwater samples) were collected using a stainless steel bailer lowered through the casing to the bottom of the boring. Grab groundwater samples were collected from the boring for Well MW-1 at depths of



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58 feet and 78 feet. Grab groundwater samples were collected from the boring for Well MW-2 at depths of 58 feet and 98 feet. These samples were sent under chain of custody to and analyzed by ATI Laboratory (ATI), Renton, Washington, for halogenated and aromatic volatile organic compounds (VOCs) using EPA Test Methods 8010 and 8020.

Following drilling, the borings were completed as groundwater monitoring wells. Well completion diagrams are included on the attached boring logs. Although the total depth of the borings was 158 feet, heaving sands prevented installation of the monitoring wells to that depth. The total depth for Well MW-1 is 128 feet with a screened interval of 108 to 128 feet. Well MW-2 was completed at a total depth of 137 feet with a screened interval of 117 to 137 feet. During completion of Well MW-2, the upper 68 feet of steel casing used during drilling of the borehole was cemented in place. The presence of the steel casing should have no impact on the integrity of the well or quality of groundwater samples collected from the well. The wells were sampled on April 21 and 22, 1993, and analyzed by ATI for halogenated and aromatic VOCs using EPA Test Methods 8010 and 8020.

The analytical results for the grab groundwater samples and samples from the completed wells are presented in Table 1 (attached). Copies of the laboratory analytical reports are also attached. Analytical results for grab samples collected from the boring for MW-1 indicate that perchloroethylene (perc) was detected in the 58-foot and 78-foot samples at concentrations of 650 micrograms per liter ( $\mu$ g/l) and 1  $\mu$ g/l, respectively. The sample collected from the completed Well MW-1 did not contain perc. Grab samples collected from the boring for MW-2 indicate that perc was detected at a concentration of 2.1  $\mu$ g/l in the 58-foot sample and was not detected in the 98-foot sample nor in the sample collected from the completed well.

The seismic reflection pilot study and geophysical logging of Well MW-1 were conducted between April 12 and 16, 1993. Results of the geophysical activities were presented in the Geophysical Sampling and Analysis Plan letter dated May 6, 1993. The geophysics pilot study in general showed that seismic reflection is a viable tool for evaluating the presence and extent of potential aquitards in this area. However, future surface geophysical surveys are not proposed at this time since the significant seismic reflection zones were detected at depths much greater than the depths at which perc was detected.

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If you have any questions or would like to discuss the results presented in this letter, please contact either of the undersigned at (415) 892-0821.

Very truly yours,

HARDING LAWSON ASSOCIATES

5 Michelle Beckman

S. Michelle Beekman

Senior Geologist

Christopher R. Smith, PG 736

Principal Hydrogeologist

Attachments: Table 1

Boring Logs

Laboratory Analytical Results

cc: Mr. Ron Lane

Mr. Rob Howarth

Mr. Michael Gaudette

Ms. Carol Sanders

Mr. Scott Vokey

Mr. Tom Mulkey

Ms. Susan Zachos

Mr. John Lerma

SMB/CRS/JC29485-V

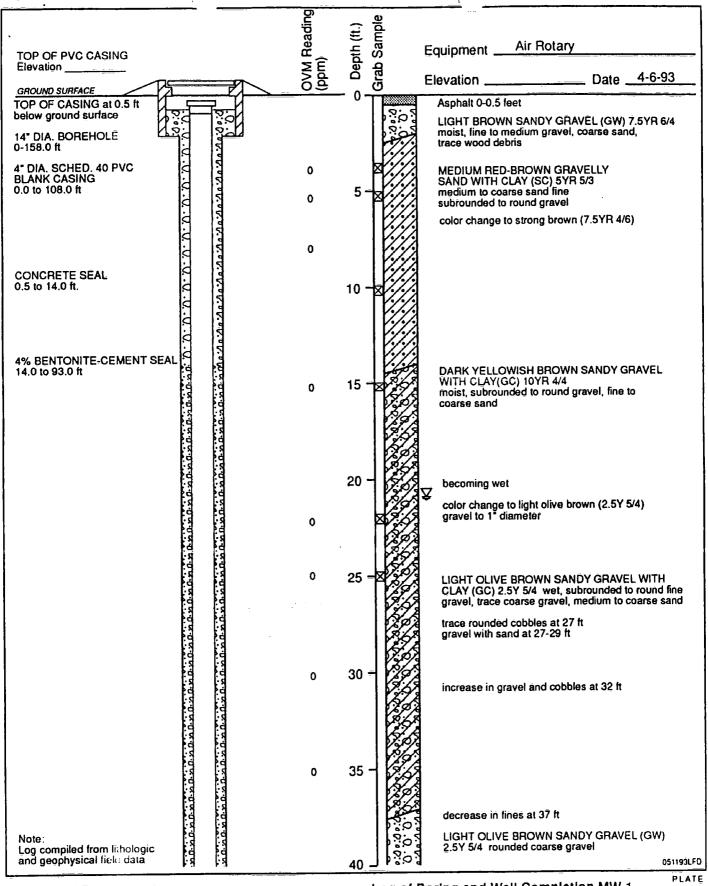
Table 1
Pilot Boring Groundwater Analytical Results

Sample Number	Sample Date	Location	Depth (feet)	Sample Type	Perc Concen- tration (ug/l)	Other Detected Analytes (ug/l)	Comments
93033101	3/31/93	MW-1-boring	58	Bailer	650	ND	
93033102	3/31/93	Equip. Blank	NA	QC	0.3	Toluene - 0.7 1,1,1 TCA - 2.8	Not detected in samples
93033103	3/31/93	Trip Blank	. NA	QC	ND <0.2	Toluene - 0.5	Not detected in samples
93033104	3/31/93	MW-1-boring	78	Bailer	1	ND	iii saiiipias
93041501	4/15/93	MW-2-boring	58	Bailer	2.1	ND	
93041502	4/15/93	MW-2-boring	98	Bailer	ND <0.2	ND	
93041601	4/16/01	Trip Blank	NÁ	σc	ND <0.2	Toluënë - 1.0	Not detected in samples
93042101	4/21/93	MW-1-well	128	Well	ND <0.2	ND	m samples
93042102	4/21/93	MW-1-well (dup)	128	Well/QC	ND < 0.2	ND	
93042103	4/21/93	Trip Blank	NA	ОС	ND < 0.2	Tolueñe - 1.0	Not detected
93042104	4/21/93	Equip. Blank	NA	αc	ND < 0.2	ND	in samples
93042201	4/22/93	MW-2-well	137	Well	ND <0.2	ND	

NA = Not Applicable

ug/l = micrograms per liter

Note: Toluene detected in trip blanks is likely a laboratory contaminant





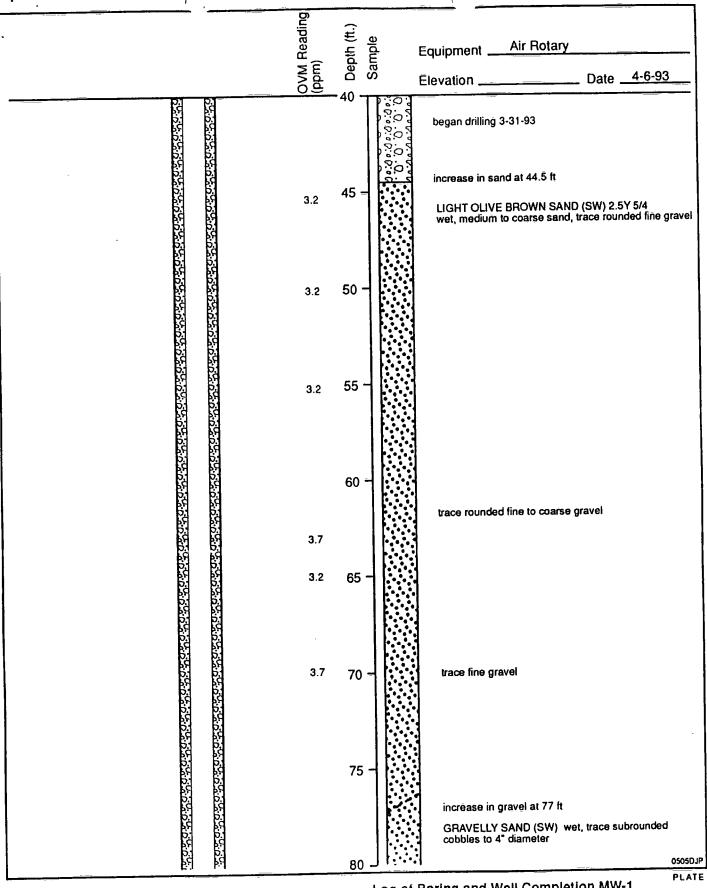
Engineering and Environmental Services

Log of Boring and Well Completion MW-1 Van Waters & Rogers Inc.

Boise, Idaho APPROVED

DATE 4/93 REVISED DATE

DEAWN JOB NUMBER 20786 0052 LZC





Engineering and Environmental Services

Log of Boring and Well Completion MW-1

Van Waters & Rogers Inc.

Boise, Idaho

DATE APPONVED JOB NUMBER DRAWN 4/93 20786 0052 LZc

REVISED DATE

OVM Reading (ppm) Depth (ft.) Sample Air Rotary Equipment \_\_\_ Date \_\_4-6-93 Elevation . began drilling 4-1-93 85 -3.7 began drilling 4-2-93 90 3.2 LIGHT OLIVE BROWN GRAVELLY SAND (SW) 2.5Y 5/4 wet, medium to coarse sand, subrounded to round fine to coarse gravel BENTONITE PELLET SĒAL 93.0 to 101.5 ft sand becoming fine at 92-94 ft 95 3.7 LIGHT OLIVE BROWN SAND WITH GRAVEL (SW) 100 -2.5Y 5/4 wet, fine with trace coarse gravel 3.7 COLORADO SI 10/20 SANDPACK 101.5 to 122.0 ft NATURAL SANDPAÇK 122.0 TO 128.0 ft. 3.2 105 color change to light olive gray (7.5Y 5/4) 4" DIA. SLOTTED SCREEN (0.020" slot size) 108.0 to 128.0 ft increase in fine sand at 110 ft 3.2 110 115 2.7 0505DJP 2.7 120 PLATE



Harding Lawson Associates

Engineering and **Environmental Services**  Log of Boring and Well Completion MW-1

Van Wäters & Rogers Inc.

Boise, Idaho

APPROVED

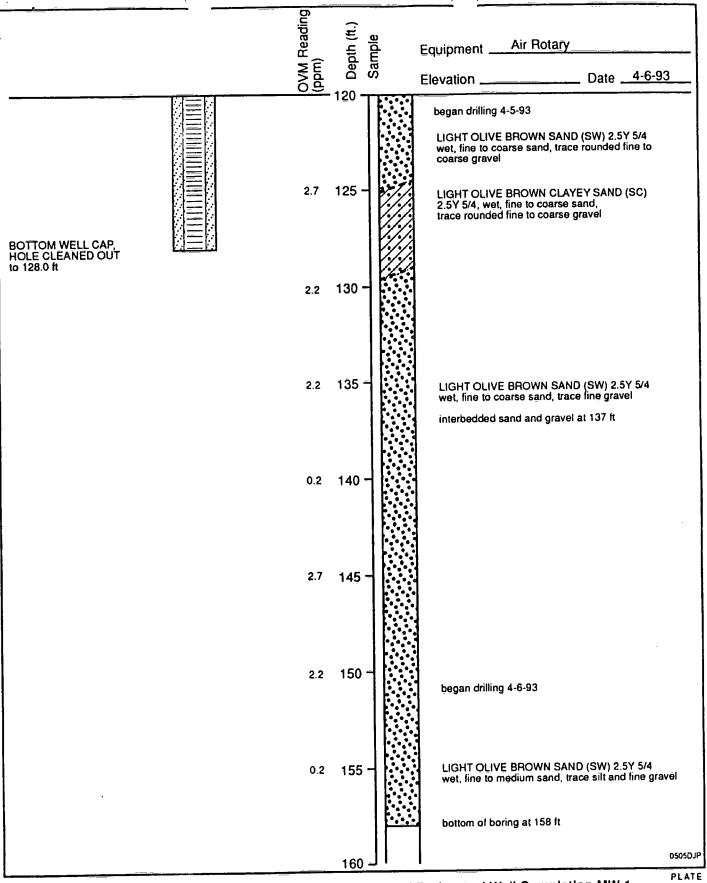
DATE

REVISED DATE

DRAWN JOB NUMBER 20786 0052

4/93

LZc





Engineering and Environmental Services

Log of Boring and Well Completion MW-1 Van Waters & Rogers Inc.

Boise, Idaho

DRAWN JOB NUMBER APPROVED LZC 20786 0052

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DATE REVISED DATE 4/93

OVM Reading (ppm) Depth (ft.) Sample Air Rotary Equipment. TOP OF PVC CASING Elevation Date <u>4-16-93</u> Elevation GROUND SURFACE Asphalt 0-0.3 ft TOP OF CASING at 0.5 ft below ground surface 8" DIA. STEEL CONDUCTOR CASING STRONG BROWN SILT (ML) 7.5YR 5/6 moist, trace fine to medium sand (Fill) 0.0 to 68.0 ft 8" DIA. BOREHOLE 4.1 5 0.0 to 158.0 ft 4" DIA. SCHED. 40 PVC BLANK CASING LIGHT GRAY GRAVEL (GW) 5YR 7/1 dry, subrounded to subangular fine to coarse gravel (Fill) 0.0 to 117.5 ft 4% BENTONITE-CEMENT SEAL 0.0 to 97.0 ft 0.1 10 LIGHT GRAY GRAVEL WITH SAND (GW) 5YR 7/1 moist, subrounded to subangular fine to coarse gravel trace rounded cobbles at 14 ft 15 0.1 LIGHT OLIVE BROWN SANDY GRAVEL (GW) 2.5Y 5/4 moist, rounded fine to coarse gravel, medium to coarse sand 303 303∆ 20 LIGHT OLIVE BROWN GRAVELLY SAND (SW) 0.1 2.5Y 5/4 moist to wet, medium to coarse sand, fine to coarse gravel LIGHT YELLOWISH BROWN SAND WITH GRAVEL (SW) 10YR 6/4 wet, medium to coarse 0.1 25 sand, fine to coarse gravel sand and gravel becoming course 30 interbedded sand and gravel trace round cobbles 35 051193LFD 40 PLATE Log of Boring and Well Completion MW-2 Harding Lawson Associates



Engineering and Environmental Services Van Wäters & Rogers Inc.

Boise, Idaho

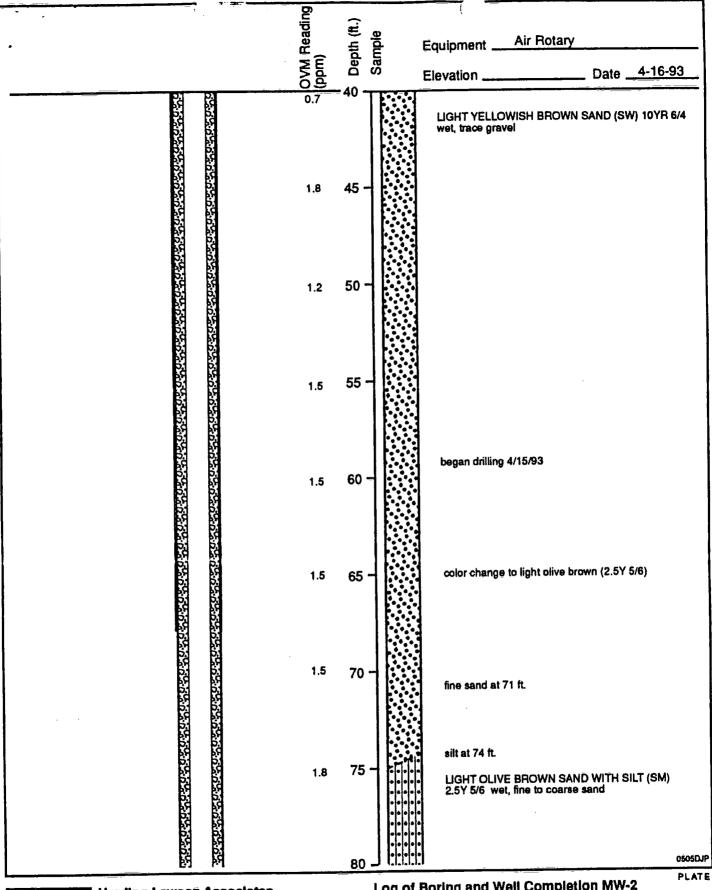
DRAWN JOB NUMBER 20786 0052 LZc

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DATE

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Log of Boring and Well Completion MW-2

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Boise, Idaho

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DATE

REVISED DATE

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JOB NUMBER 20786 0052

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•		OVM Reading (ppm)	Depth (ft.)	Sample	Equipment Air Rotary Date4-16-93
	5.4.5.4.5.4.5.4.5.4.5.4.5.4.5.4.5.4.5.4	1.8	-80 -		LIGHT OLIVE BROWN SAND (SW) 2.5Y 5/6 wet, trace gravel
	<u> </u>	1.5	85 -		LIGHT OLIVE BROWN GRAVELLY SAND (SW) 2.5Y 5/6 fine to coarse sand, rounded to subrounded fine to coarse gravel
	<u> </u>	1.5	90 -		decrease in gravel content
	<u> </u>	1.5	95 -		
BENSEAL 97.0 to 110.0 ft		1,5	100 -		
	- - 	1.5	105 -		
NATURAL SANDPACK 110 to 112 ft			110 -		
COLORADO SI 10/20 SANDPACK 112.0 to 134.0 ft					·
NATURAL SANDPACK 134.0 to 137.5		1.5	115 -		LIGHT OLIVE BROWN SAND WITH GRAVEL (SW) 2.5Y 5/6 wet, medium to coarse sand, subrounded to subangular fine gravel
4" DIA. SLOTTED SCREEN (0.020" slot size) 117.5 to 137.5 ft			120 –		0505DJF



Engineering and Environmental Services

Log of Boring and Well Completion MW-2

Van Waters & Rogers Inc.

Boise, Idaho

APPROVED

DATE REVISED DATE

DRAWN JOB NUMBER LZC 20786 0052

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4/93

Depth (ft.) Sample Air Rotary Equipment . Date <u>4-16-93</u> Elevation. 1.5 125 LIGHT OLIVE BROWN SAND (SW) 2.5Y 4/6 wet, medium to coarse sand, trace gravel 1.5 130 1.5 135 BOTTOM WELL CAP. HOLE CLEANED OUT to 137.5 ft began drilling 4-16-93 140 145 150 increase in fine sand at 151 ft 155 bottom of boring at 158 ft 0505DJP 160 -PLATE



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JOB NUMBER

20786 0052

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Log of Boring and Well Completion MW-2

Van Waters & Rogers Inc.

Boise, Idaho

REVISED DATE DATE APPROVED 4/93

